

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A twist drill for forming holes in or through a workpiece, having a longitudinal axis around which the twist drill is rotated and in the direction of which the twist drill is advanced into the workpiece, and two transverse axes disposed perpendicular to each other and to the longitudinal axis, comprising:

a shank, for enabling the twist drill to be mounted to a driving device;
a body emanating from, and coaxial with the shank, the body having a radius;
at least one flute extending helically along the body;
at least one land disposed adjacent to the at least one flute;

and

a point structure, formed on an end of the body distal to the shank,
the point structure being generally in the form of a brad point having an extreme tip through which the longitudinal axis of the drill passes,
the point structure further having two spur structures on opposite sides thereof;
a cutting lip on a leading edge of each of the spur structures,
the drill further including planar axial relief surfaces on trailing surfaces of the lands, the axial relief surfaces being separated from the leading edges of the spur structures by one or more planar cutting edge surfaces, wherein the axial relief surfaces are disposed at a separate, substantially steeper angle, relative to a plane perpendicular to the longitudinal axis of the twist drill, than the one or more planar cutting edge surfaces;

wherein the axial relief surfaces intersect the extreme tip.

2. (Original) The twist drill according to claim 1, wherein the point comprises a first radially outwardly disposed portion of the at least one land angling inwardly and axially toward the shank, to a position between a peripheral portion of the body, and the longitudinal axis and a second, radially inwardly disposed portion of the at least one land, angling inwardly and axially away from the shank and toward the central point structure.

3. (Previously presented) The twist drill according to claim 2, wherein the first radially outwardly disposed portion of the at least one land is defined at least in part by

a leading edge angle (β_1) and a trailing edge angle (β_2) wherein (β_1) = $15^\circ \pm 10^\circ$ and (β_2) = $12^\circ \pm 7^\circ$.

4. (Previously presented) The twist drill according to claim 2, wherein the second, radially inwardly disposed portion of the at least one land is defined at least in part by a point angle (α_1), and an angle (α_2) which represents an axial separation between the central point structure and radially outer portions of the at least one land, wherein (α_1) = $80^\circ - 100^\circ$, inclusive; and (α_2) = $140^\circ - 170^\circ$, inclusive.

5. (Original) The twist drill according to claim 1, further comprising:

the at least one flute terminating in a cutting lip disposed proximate the point;
the at least one flute having a sectional configuration, in a plane perpendicular to the longitudinal axis, incorporating

a leading edge,

a trailing edge,

a straight surface extending inwardly from the leading edge, at least to a position coplanar with a plane passing perpendicularly through the straight surface to the longitudinal axis,

a first concave curved portion, extending from an inward end of the straight surface,

a second concave curved portion, extending inwardly from the trailing toward an outer edge region of the first concave curved portion, and

a ridge formed by the intersection of the outer edge region of the first concave curved portion and an inner edge region of the second concave curved portion.

6. (Original) The twist drill according to claim 5, wherein the ridge is in the form of a pointed spike.

7. (Original) The twist drill according to claim 5, wherein the ridge is in the form of a rounded bump.

8. (Currently amended) A twist drill for forming holes in or through a workpiece, having a longitudinal axis around which the twist drill is rotated and in the direction of which the twist drill is advanced into the workpiece, and two transverse

axes disposed perpendicular to each other and to the longitudinal axis, the twist drill comprising:

- a shank, for enabling the twist drill to be mounted to a driving device;
- a body emanating from, and coaxial with the shank, the body having a radius;
- at least one flute extending helically along the body;
- at least one land disposed adjacent to the at least one flute;

and

- a point structure, formed on an end of the body distal to the shank,
 - the point structure being generally in the form of a brad point having an extreme tip through which the longitudinal axis of the drill passes,
 - the point structure further having two spur structures on opposite sides thereof;
 - a cutting lip on a leading edge of each of the spur structures,
 - the drill further including planar axial relief surfaces on trailing surfaces of the lands, the axial relief surfaces being separated from the leading edges of the spur structures by one or more planar cutting edge surfaces, wherein the axial relief surfaces are disposed at a separate, substantially steeper angle, relative to a plane perpendicular to the longitudinal axis of the twist drill, than the one or more planar cutting edge surfaces;
 - the at least one flute including a leading edge,
 - a flat surface extending parallel to one of the transverse axes inwardly a distance at least equal to a radius of the drill from the leading edge to a position proximate the second of the transverse axes,
 - at least a first convex curved portion, emanating from an inner end of the flat surface, for prompting rapid breakup of chips formed by the point and guided into the at least one flute by rotation of the drill,
 - the at least first convex curved portion terminating in a ridge disposed between the longitudinal axis of the drill and a trailing edge of the at least one flute;
- wherein the axial relief surfaces intersect the extreme tip.

9. (Original) The twist drill according to claim 8, further comprising:

a second convex curved portion, disposed in the at least one flute, between the ridge and the trailing edge of the at least one flute.

10. (Original) The twist drill according to claim 8, wherein the ridge is in the form of a sharp spike extending along the at least one flute.

11. (Original) The twist drill according to claim 8, wherein the ridge is in the form of a rounded bump extending along the at least one flute.

12 - 15. (Withdrawn).